

REMARKS

In the Office Action dated March 26, 2003, claims 1-2, 5, 9-10, 12-15, and 18-29 are pending. Claim 9 has been canceled. Claims 30-35 have been newly added. Claims 1, 10, and 15 have been amended. Claims 1, 10, 15, and 30 are independent claims from which all other claims depend therefrom.

Paragraph [0031] of the specification stands objected to for the use of the trademark "GeoProbe" without the use of the generic terminology. Paragraph [0031] has been amended to include the generic terminology of the techniques used by GeoProbe® Systems, namely direct push and auger drilling. Paragraph [0031] has also been amended to provide a brief general description as to the operation of the GeoProbe® Systems.

Claim 9 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As stated, claim 9 has been canceled.

Claims 1-2, 10, 12-15, 18-22, and 24-28 stand rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Perriello.

Claims 1, 10, and 15 have been amended and in addition to the limitations of pressurizing and delivering a liquid without electricity or any mechanical moving parts, claims 1, 10, and 15 also include the limitations of non-electrically operating and regulating supply, conveyance, and injection of vapor and microbials into a groundwater. In doing so, the methods and system of claims 1, 10, and 15 provide a simple and inexpensive technique for the remediation of a contaminated region of a subterranean body of groundwater.

Perriello discloses an in-situ bioremediation system. The system of Perriello includes the use of a butane injection system and an air injection system, which are used in combination. Both the butane injection system and

the air injection system include electrical componentry for the regulation of butane and air. The electrical componentry includes digital timer controls, solenoids, and gates valves.

Perriello does not teach or suggest the operation and the regulation of a bioremediation system using non-electrical techniques. The system of Perriello in utilizing multiple electrical components is complex and expensive, as compared to the system and methods as claimed in claims 1, 10, and 15. Thus, Perriello does not teach or suggest each and every element of claims 1, 10, and 15. Applicant submits that claims 1, 10, and 15 are therefore novel, nonobvious, and are in a condition for allowance, at least under 35 U.S.C. 102(e), in view of Perriello.

Also, it would not have been obvious by one skilled in the art to convert the electrical system of Perriello into a non-electrical system. In multiple sections of the specification of Perriello the electrical use of the timers, solenoids, and gates are described and used to regulate the flow of multiple fluids. The electrical components are used for supplying constant and variable flow rates. Multiple electrically pulsed suggestions are also provided. Nor would it have been obvious to convert the electrically based systems and methods of Perriello into the non-electrically based system and methods as claimed in claims 1, 10, and 15. Thus, Applicant submits that claims 1, 10, and 15 are novel, nonobvious, and are in a condition for allowance, at least under 35 U.S.C. 103(a), in view of Perriello.

Claims 1 and 15 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabata et al. (USPN 5,803,664) in view of Anthony et al. (USPN 3,505,213).

Kawabata discloses a process for remediating soil. The process includes the use of an injection apparatus. The apparatus includes the use of multiple pressure pumps. The pumps are simply used to pressurize and inject gas into the soil. No regulation technique of the gas is described or suggested.

Anthony provides an apparatus for purifying water. The apparatus of Anthony is electrically based. The apparatus of Anthony uses an electrical power source, such as batteries, fuel cells, and generators, to supply electrical power to a monitoring system, an ozonator, sensors, pumps, and compressors.

Neither Kawabata nor Anthony teach or suggest non-electrical operation and regulation of gases or fluids within a remediating system. Kawabata does not teach or suggest regulation of any fluid and Anthony discloses the use of several electrically powered and controlled devices. Since Kawabata and Anthony alone or in combination do not teach or suggest each and every element of claims 1 and 15, claims 1 and 15 are also novel, nonobvious and are in a condition for allowance at least with respect to 35 U.S.C. 103(a) in view of Kawabata and Anthony.

Claim 10 also stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabata as applied to claims 1 and 15 above, and further in view of Udell et al. (USPN 5,018,576).

Udell discloses a process for the in-situ decontamination of subsurface soil and groundwater. Although the process of Udell may include multiple injection points, the process also includes multiple pumps and condensers, which are mechanically moving parts and may be electrically powered. Both Kawabata and Udell both use mechanical moving parts, such as the pumps and condensers, in the supply of fluids.

Additionally, Udell provides regulation valves for the control of fluid flow to the injection wells. The regulation valves are manually operated valves that are simply used to adjust fluid flow, as shown in Figure 1 of Udell. The valves do not regulate or meter the pressure of fluid. Thus, as with Kawabata, Udell also does not teach or suggest the non-electrical regulation of a fluid. Thus, Kawabata and Udell alone or in combination do not teach each and every element of claim 10, claim 10 is therefore also novel,

nonobvious and is in a condition for allowance at least with respect to 35 U.S.C. 103(a) in view of Kawabata and Udell.

Claims 1, 10, and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Carter (USPN 5,874,001) in view of Anthony.

Carter discloses a ground water remediation method. The method includes the injection of oxygen into the ground water. No regulation technique of the oxygen is described or suggested. Thus, neither Carter nor Anthony alone or in combination teach or suggest the non-electrically regulated methods and system, as claimed in claims 1, 10, and 15. Claims 1, 10, and 15 are therefore novel, nonobvious and is in a condition for allowance at least with respect to 35 U.S.C. 103(a) in view of Carter and Anthony.

Claims 1, 10, and 15 also stand rejected under 35 U.S.C. 103(a) as being unpatentable over Keist et al. (USPN 5,879,107) in view of Anthony.

Keist discloses an underground contamination in-situ treatment system. The system injects fluids into a subsurface. The system includes pumps and motors for the pressurization and supply of fluids to the subsurface. The system of Keist also uses mechanical moving parts for the supply of the fluids. Keist also discloses a manually operated valve for the control of fluid flow. The operated valve does not regulate the flow of fluids. As with Anthony, Keist does not teach or suggest non-electrical regulation of the fluids as claimed in claims 1, 10, and 15. Thus, neither Keist nor Anthony alone or in combination teach or suggest the non-electrically regulated methods and system, as claimed in claims 1, 10, and 15. Claims 1, 10, and 15 are therefore novel, nonobvious and are also in a condition for allowance with respect to 35 U.S.C. 103(a) in view of Keist and Anthony.

Applicant further submits that objections and rejections with regards to claims 1, 10, and 15 have been overcome and since claims 2, 5, 12-14, and 18-29 depend from claims 1, 10, and 15, respectively, they are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claims 30-34 are newly added claims. Claim 30 recites a method for remediating a contaminated region of a subterranean body of groundwater. The method includes providing one or more injection points that extend from above ground to the subterranean body of groundwater. A supply of a substantially pure liquid that has substantially a single element is provided. The substantially pure liquid is converted into a vapor. The vapor is conveyed to a non-electrical regulating mechanism. The vapor is delivered through the regulating mechanism to the injection points and into the subterranean body of groundwater. An amount of microbials is delivered to the injection points and into the subterranean body of groundwater to assist in the reduction of the level of contaminants.

Neither Perreillo, Kawabata, Anthony, Udell, Carter, nor Keist alone or in combination teach or suggest the limitations and combination thereof as claimed in claim 30. Neither Perreillo, Kawabata, Anthony, Udell, Carter, nor Keist alone or in combination teach or suggest the supply of a pure liquid having a single element, the non-electrical regulation of the liquid, and the injection of microbials in combination with the liquid. This combination of these limitations simplifies and reduces expense involved in the remediation process. None of the references teach or suggest non-electrical regulation of a pure liquid having a single element. None of the reference teach or suggest injection of microbials in combination with the non-electrically regulated pure liquid. Thus, neither Perreillo, Kawabata, Anthony, Udell, Carter, nor Keist alone or in combination teach or suggest each and every element of claim 30.

Claims 31-35 provide additional limitations to the limitations provided in claim 30. Each of the separate limitations provided by claims 31-35 in combination with the limitations provided in claim 30 are also not taught or suggested by the above stated references. Claim 31 adds the limitation of the single element being oxygen. Claim 32 adds the limitation of the microbials being oxygen-utilizing bacteria. Claim 33 adds the limitation of

pressurization of the substantially pure liquid and delivery thereof being performed using non-electrically operated or controlled devices. Claim 34 adds the limitation of the non-electrical regulating mechanism having one or more ball float valves, as shown in Figure 3 of the present application. Claim 35 adds the limitation of the microbials being combined with the substantially pure liquid at a substantially constant pressure.

The limitations provided in claims 31-35 assure an efficient and accurate regulated supply of the pure liquid and microbials to the groundwater. Note that the use of oxygen-utilizing bacteria is not limited to the use of butane-utilizing bacteria and is injected such that there is direct utilization of the supplied oxygen by the supplied microbials. Also, the use of ball float valves provides a simple, accurate, inexpensive, and non-electrical technique for metering flow of the pure liquid at a predetermined pressure. The ball float valves also provide a precise technique for metering fluid flow at low pressures.

Thus, the additional claim limitations provided in claims 31-35 further provide additional novelty over that of claim 30 and are therefore also nonobvious and are in a condition for allowance.

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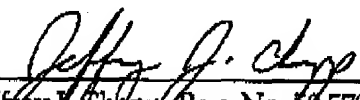
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In light of the amendments and remarks, Applicant submits that all objections and rejections are now overcome. The Applicant has added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, he is respectfully requested to call the undersigned attorney.

Respectfully submitted,

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